

Vol. 1 No. 2

MAY 1982



SYNCHRO ' SETTE

THE SUBSCRIPTION
MAGAZINE

FOR THE ZX-81
MICROCOMPUTER

SYNCHRO SETTE

THE SUBSCRIPTION MAGAZINE FOR THE ZX-81 MICROCOMPUTER

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MAY 1982

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SYNCHRO-SETTE is published
monthly by:

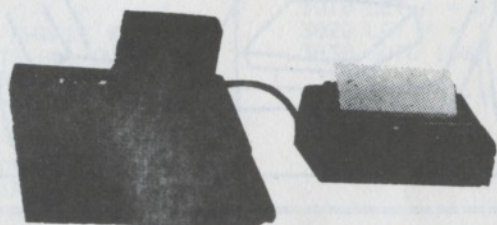
THE S & S COMPANY
388 W. Lake Street
Addison, IL 60101
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Gene G. Buza - Editor

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16K SINCLAIR/TIMEX COMPUTER FOR \$150

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Timex Computer Corporation in agreement with Sinclair Research announced in April that it will be offering a computer called the Timex Sinclair 1000.

It will be approximately the same size and weight as the ZX-81 and will sell for \$99.95 already built. It is portrayed by Timex as being an enhanced ZX-81 with an 8K ROM and 2K of RAM. It will be able to hook up to any standard TV set and plans are for it to be available in the U.S. in July of this year and will be sold through the following outlets:

- Computer Stores
- Department Stores
- Jewelry Stores
- Drug Stores

There will be over 100,000 Timex retail outlets nationwide.

Also available will be a 16K RAM cartridge for \$49.95. That's right, \$49.95. That brings the total price for a 16K machine to under \$150.

Sometime after October, a 32 column printer and a telephone modem operating at 300 baud and having computer-keyboard dialing capability will both be selling for \$99.95 each.

The 300 baud rate of the modem tells me that the T/S 1000 might not be compatible with the programs written for the ZX-81 which operates its cassette loads at 250 baud.

Software for both home and education will be offered in a price range between \$9.95 to \$19.95. Even a Visacalc type business program will be available but the exact time of when any of the software will be ready is not known at this time although speculation is that about 25 programs will be available when the computer hits the shelves in July.

Timex states that this will be the first of a line of computers to be offered and rumor has it that a future model will incorporate Sinclair's flat screen TV and will be battery powered and completely portable.



ARTIFICIAL INTELLIGENCE

ARTIFICIAL INTELLIGENCE FOR THE ZX-81

You may have heard of some of the programs that make computers give seemingly intelligent or human-like response.

The ELIZA or DR. CHIPS programs for other microcomputers simulate a doctor psychoanalyzing a patient. These programs are so human-like as to confuse actual doctors when they are asked to tell them apart from their human counterparts.

In order for a computer to engage in an intelligent conversation with its user, it uses basically 2 different types of algorithms (computer formula routines).

The first type is a KEYWORD SEARCH algorithm that looks at the sentence the user typed in, checks it for proper sentence structure and then identifies key words or phrases in that sentence in much the same way that the 1K program INSTRING (APR-82 cassette) can single out

words.

Upon finding a key word or phrase, it the cross-references this information to the second algorithm type, the RANDOM RESPONSE GENERATOR. This algorithm gives a response sentence, sometimes interjecting words from the user's sentence or past sentences. This response sentence may be one of three or more response sentence shells (missing key words) picked by the computer program at random. This is done so that the simulated conversation does not easily become repetitive.

The following program, instead of giving intelligent sentences, can generate up to 625 nonsensical messages using a total of 21 words or phrases using the programming techniques outlined in the READ, DATA & RESTORE article of APRIL, 1982.

Change the DATA lines if you wish to create your own messages or add additional DATA to give a larger assortment of sentences (don't forget to increase the RND routines).

16K RAM Required:

```

10 LET M = 1
20 LET A = 0
30 SCROLL
40 RAND 0
99 REM * SENTENCE SUBJECT *
100 LET A$ = "SUPERMAN,MICKEY
    MOUSE,DICK TRACY,DARTH
    VADER,PORKY PIG,"
110 LET E$ = A$
120 GOSUB 1000
199 REM * VERB OR PHRASE *
200 LET B$ = "SPITS ALL OVER,
    HATES,KISSES,SITS ON,
    DROPS,"
210 LET E$ = B$
220 GOSUB 1000
299 REM * OBJECT OR PHRASE *
300 LET C$ = "GIRLFRIEND,DOG,
    COMPUTER, TOENAILS,
    FOOTBALL,"
310 PRINT "HIS "
320 SCROLL
330 LET E$ = C$
340 GOSUB 1000
399 REM * PREDICATE *
400 LET D$ = "WHILE DRINKING
    BEER.,LIKE A MANIAC.,AND
    ENJOYS IT.,BUT IS SORRY
    LATER.,WITH A VENGEANCE.,"
410 LET E$=D$
420 GOSUB 1000
430 SCROLL
439 REM * RESEED RANDOM GEN-
    ERATOR ROUTINE *

```

ED note - if this is not done, the messages become repetitious - changing <RND*100> in line 440 to a lower number, increases the chance of repeat messages. This and the routine in lines 1010 to 1030 reseed the random generator as RAND does not work well enough alone. Try the program by eliminating these lines and see what happens.

```

440 IF INT (RND*100)<>5 THEN
    GOTO440
450 RUN
999 REM * RANDOM GENERATOR *
1000 RAND
1010 FOR I = 1 TO INT (RND*10)
1020 LET X = (RND*65535)
1030 NEXT I
1039 REM * PICK RANDOM DATA *
1040 LET X = INT (RND*5) + 1
1050 FOR N = 1 TO LEN E$

```

```

1060 IF E$(N) = "," THEN GOTO
    2000
1070 NEXT N
1080 RETURN
1999 REM * FIND SEPARATOR *
2000 LET A = A + 1
2010 IF A = X THEN GOTO 3000
2020 LET M = N + 1
2030 GOTO1070
2999 REM * FIND RANDOM DATA *
3000 PRINT E$(M TO N - 1);" ";
3010 LET A = 0
3020 LET M = 1
3030 GOTO 1080

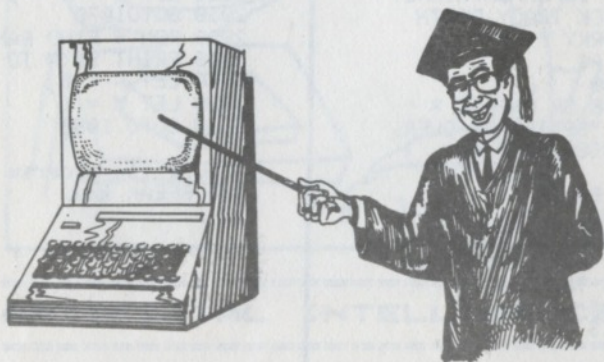
```

End the program by pressing the BREAK key.



"According to this Synchro-Sette program, we only have enough money to make 3 more payments on this thing!"

the Computer Tutor



Dummy Screen Memory Map

One of the programs you received on the APR-82 cassette was a game called BOUNCING-BOMES. This program uses a unique routine that memory-maps the CRT screen with BASIC programming commands.

The ZX-81 does not have as part of its resident utilities programmed in ROM, a screen memory mapping utility. Characters or graphics that appear on the screen are forgotten by the computer. If you want the computer to look at a certain part of the screen and see what is there, the ZX-81 does not have this capability from what is provided in its pre-programmed memory.

This does not mean that it can not be done.

The secret lies in correlating the information that appears on the screen, as it appears on the screen, with memory locations in RAM.

Sounds confusing, doesn't it? Think of your computer's memory banks as being a large hotel. This building is 64 stories tall. Each floor has 1024 rooms to it.

The first 16 floors are pretty much taken up by utilities used to keep the hotel operational. These are the ROM or Read Only Memory floors. For all practical purposes, you can not put anything into the rooms on these floors. The hotel manager (Z-80 microprocessor) will allow you to use any of the above floors starting with the 17th and will also allow you any of the services provided by the lower floors.

If you have a 1K machine, this means you have rented the entire 17th floor and can put anything into any of the rooms on that floor. These floors are known as RAM or Random Access Memory.

If you have a 16K machine, you have rented the floors from 17 to 32 and a total of 16,384 rooms.

Let us look at the following program. This is not a memory mapping program but it will show you how to POKE information into those rooms and then PEEK into those rooms and recall it. To make the program a little more dramatic, the information will be recalled in the reverse order that it was entered.

```
10 PRINT "TYPE IN YOUR MESSAGE  
AND ENTER"  
20 INPUT A$  
30 LET A = 17000  
40 LET B = A  
100 FOR N = 1 TO LEN A$  
110 POKE A, CODE A$(N)  
120 LET A=A+1  
130 NEXT N  
140 PRINT  
150 PRINT A$  
160 PRINT  
200 FOR N = B + LEN A$ - 1  
    TO B STEP -1  
210 PRINT CHR$( PEEK N);  
220 NEXT N
```

This program puts your message in an area starting in memory location 17000 and then recalls it. If you were to change the number 17000 in line 30 to a number low enough, the program would bomb, because the program itself resides in memory locations lower than 17000. The POKE routine in line 110 would actually destroy the operation of the existing program commands.

Try changing it to 16400 and see what happens (make sure you save it on cassette first).

Try changing it to 64000 and see what happens.

Why?

In the program, BOUNCING BOMBS, lines 15, 16 and 17 reset the memory locations from 30000

to 32000 to a value of 0. This is done just in case any stray numbers may have entered these locations.

The routine from lines 20 to 170 set up the screen graphics. Lines 90 to 130 build the random city and line 115 POKES into memory the number <128> for each of the city's building blocks starting with the possible memory location of 30000. The memory locations correspond with the screen co-ordinates of each building block.

Line 400 determines if the <Z> key was pressed at the proper time and if it was, the program proceeds to create a graphic bomb that moves from one screen location to another. The graphic bomb is PLOTted into its new screen location and its previous location is UNPLOTted.

If the graphic bomb happens to occupy the same screen location as one of the buildings' blocks, the block will disappear. This is determined by the routine starting at line 2000. It PEEKs into the corresponding memory location and if it finds the number <128> residing there, it goes through a series of routines that add a point to your score and change the contents of that memory location back to <0>. This way if a bomb ever enters that memory location again, it is instructed to pass right through it without adding points to your score and if no blocks were encountered during the bombs travel, another routine credits you with a miss.

The following is a short program that demonstrates the memory mapping of the screen without POKeing the information into memory. Consult page #89 of your ZX-81 manual for screen co-ordinate locations.

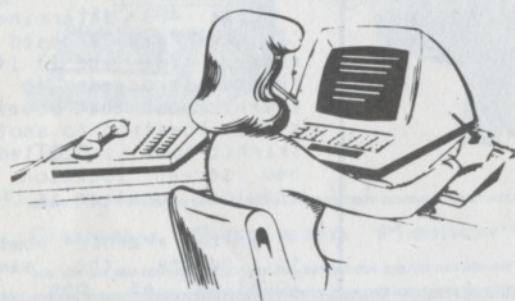
.....
CONTINUED ON PAGE 12

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WOULD YOU LIKE TO WRITE FOR

** SYNCHRO-SETTE? **

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We are looking for programs and articles. If you feel you have a program or article that would be of general interest to our subscribers, please contact us.

Programs can cover just about any subject and can be either for the 1K or 16K ZX-81 or converted ZX-80. Subjects of normal interest are games, education, sports, business, computer utility programs, graphs, graphics, word-processing and some specialty programs. There has been particular interest in machine or assembly language programs.

If you have a program, contact us by mail or phone and we

will send you the particulars by mail. Programs sent to us directly should be on cassette and be de-bussed. We also need type-written, easy to understand documentation on the nature and use of the program.

If you have had an interesting experience or information that you feel could be newsworthy, by all means, put it down in a type-written article and send it to us.

We will proof-read each article or program documentation and reserve the right to evaluate and edit it to our specifications.

Let us here from you out there!

Editor

Ramblings



The most exciting news this month is from the Rumor Mill. A Chicago based company is investigating the feasibility of providing a Time-Sharing service to ZX-81 owners.

The concept of the idea lies in three areas:

1- The subscriber would receive a telephone modem that would either transmit or receive information over existing phone lines through the company's toll-free WATTS line.

This device would be a used but high-quality refurbished modem that was used to connect large Main-Frame computers such as IBM, DEC and General Data.

It sold for over \$300 new but will be sold outright for around \$50 to \$75 in its ZX-81 converted condition.

Another possibility is a brand

new modem specifically designed for the ZX-81 hopefully in the same price range and of higher quality than existing ZX-81 modems.

2 - The company would provide to the subscriber, services similar to those offered by other time-sharing Companies such as MICRO-NET and THE SOURCE and the subscriber would be billed through a credit card or possibly by monthly statements.

A bulletin Board with the latest information on the ZX-81 from User's Groups and supporting Companies will provide the subscriber with up to date knowledge.

3 - The company will act as a Clearing House and will offer to the subscriber hardware and software for the ZX-81. Some of the programs may be sold in such a manner where the program will

be sent right over the phone into the subscriber's computer and the subscriber will be billed accordingly.

This represents an exciting prospect to the subscriber. Picture if you can, dialing an 800 phone number, and when you hear the identifying tone, placing the receiver into the modem that is connected to your computer. With the proper password entered from your keyboard, you can observe all sorts of information on your CRT. You can order programs that will either be sent to you through the mail or over the phone.

You can also use this modem to communicate with other ZX-81 owners through any existing phones.

I haven't had any complaints yet about the loadings or quality of any of the cassette programs.

One customer was amazed that our programs loaded with no problems but that programs that were produced by the computer on tape were almost impossible to load.

I can only assume that this means we are doing something right.

If you still have problems loading programs produced by the ZX-81 and have tried all the

tricks noted in our APRIL/82 issue, you might try the hints outlined in this month's article, **HOW TO MAKE PERFECT CASSETTE COPIES.**

You may notice that our programs allow a larger range in the volume settings and will still load properly from most cassette recorders. This was not the case when the first software vendors were supplying programs for the first microcomputers in the first few years of the industry.

It was not uncommon to purchase a program and have extreme problems trying to set it to load. It also was not uncommon to save a program yourself and have difficulty trying to load it. This was usually because the cassette recorder was unable to reproduce the high-pitch audio pulses.

One software company hired the services of a firm that specialized in duplicating music on tape. The firm assured the software company that they could make duplicates of any recorded sounds with their sophisticated equipment. They couldn't. The software company received many mail orders, collected the purchase price and used the money to try to correct the problem by hiring people with knowledge in the field.

They sent letters to their customers assuring them that they were working on the problems but after some months finally decided it was easier to declare bankruptcy.

COLOR COMPUTER FROM SINCLAIR

A new computer has been introduced in England called SPECTRUM by Sinclair. It sells for approximately \$240 and has the following features:

- ... Full memory mapped screen
- ... Typewriter style keyboard
- ... Audio output
- ... Color characters & graphics
- ... Capability to dump strings arrays, variables and screen images to cassette
- ... 1500 baud tape data rate (6 times faster than ZX-81)
- ... 256 X 192 pixel resolution
- ... User definable functions
- ... Real time clock
- ... Multi-Dimensional Arrays

Items planned to be interfaced to the SPECTRUM are:

- ... RS-232 interface
- ... Micro-Drive
- ... ZX Network

The keyboard uses real moving button keys that when pressed, strike a membrane contact layer. This makes it possible to touch type with relative ease.

The SPECTRUM can detect the changes in the automatic condenser volume control of the cassette recorder and strengthen the inputted signal not only for programs but for any of the data files stored on tape.

The 1500 operating baud rate is 6 times as fast as the 250 baud rate of the ZX-81. This means comparable programs can be loaded or saved in 1/6th the time.

The built in BASIC interpreter will remain

essentially the same as the ZX-81 with single keystrokes for all keywords and commands. Each keystroke will be checked for accuracy and if incorrect input occurs, an error marker will appear in the proper location.

Several new commands are included such as the color control commands PAPER and INK that control the foreground and the background of the screen and the graphic commands ARC, CIRCLE, LINE, OVER, PLOT and POINT. The user may also create graphic characters that can be designed easily from binary patterns and then recalled from a statement in the program. These graphic patterns may be stored in a program on tape.

The real time clock allows the user to create a program that tells the difference in time between events occurring in a program. An example might be a game that allows the player only a certain amount of time to destroy a Klinton before the Klinton destroys the player.

The memory mapping of the screen is quite useful in both games and business programs. If certain pixels of the screen are lit, this information can be cross-referenced to routines in the program to achieve the desired effect.

An example might be having the program PEEK the corresponding screen location in memory to see if a Klinton was registered there as your missile is about to enter that location (see article DUMMY SCREEN MEMORY MAP in this issue).

If the Micro-Drive is intended to be an actual disk drive, this is a long awaited necessity for most of us. It will be interesting to see what it will cost.

For those of you who do not know the advantages of a disk drive compared to a cassette recorder, let me explain the difference. To load a program from a cassette by name, the computer must search the tape until it comes to the program asked for. If it detects a different program along the way, it will ignore it. This of course wastes a lot of time as programs preceding the desired one are ignored but still have to be encountered.

A floppy disk drive uses a flexible disk made of plastic, usually mylar, encased in a cardboard jacket. The drive, when engaged, spins the disk inside of the jacket much like a phonograph record. There is a Read/Recording head that either transmits or receives magnetic information from the disk by moving either toward or away from the center to the edge of the disk as it is spinning. When it finds the information it is looking for, it locks onto that portion of the disk (it doesn't touch the disk, but only keeps close to it) and keeps moving slowly either toward or away from center until all the information required is stored in the computer's memory. Actually, it's a little more complicated than this, but at least you have the idea.

With the SPECTRUM, the purchaser will have comparable computing power and graphics capability to the APPLE 2 at about \$1000 less than the purchase price.

Unfortunately, Mr. Sinclair has made no announcement when the SPECTRUM will be introduced to the U.S. but our estimate is sometime in early 1983.

CONTINUED FROM PAGE 7 THE COMPUTER TUTOR

.....

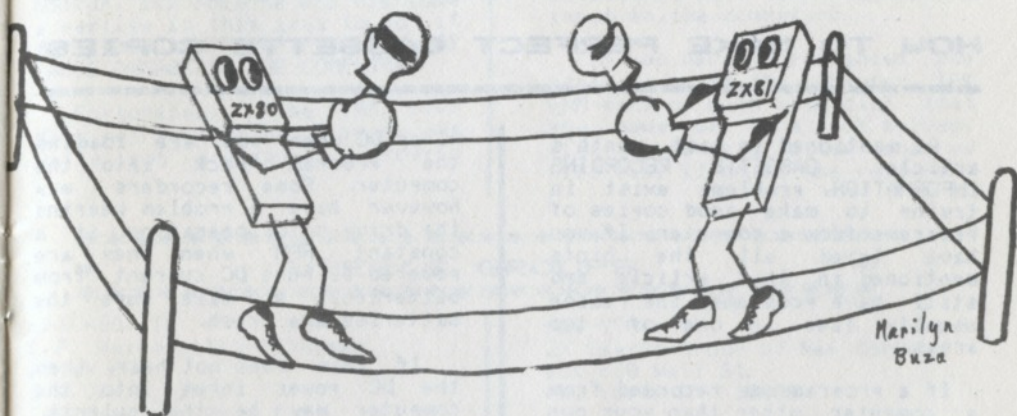
```
100 PRINT "ENTER YOUR NAME"
110 INPUT A$
120 LET A = LEN A$
130 DIM X(A)
140 DIM Y(A)
200 FOR N = 1 TO A
210 LET X(N) = INT (10 * RND)
220 LET Y(N) = INT (32 * RND)
230 PRINT AT X(N),Y(N);A$(N)
240 NEXT N
300 PRINT AT 10,0;"CO-ORDINATES
(X) (Y)"
310 FOR N = 1 TO A
320 PRINT A$(N);TAB 16;X(N);TAB
23;Y(N)
330 NEXT N
```

The routine starting at line 100 dimensionalizes all the variables. It allows the total amount of each variable to be equal to the amount of characters in your name (11 is the limit).

The routine starting at line 200 picks random screen positions for these characters to appear on the top half of the screen.

The routine starting at line 300 cross-references these positions to the variables held in memory and prints them on the lower half of the screen.

You may notice that sometimes, letters are missing but their positions are listed. This is because the screen co-ordinates that were picked at random, were picked again for a different character. This can easily be evidenced by looking for duplicate co-ordinate positions.



THE ZX-80 versus THE ZX-81

INCOMPATIBILITIES BETWEEN THE ZX-80 WITH 8K ROM & THE ZX-81

If any of you have a ZX-80 that you have converted to the 8K ROM, you probably noticed that some of our cassette programs will not run properly.

The same programs, SPIDER DAN, MINEFIELD 1 & 2, RALLY and BOUNCING BOMBS will not operate at all without modifications made to the program. Also programs like RORSCHACH and BIORHYTHM operate but without any screen graphics until the computer completes the calculations of the program's formulae.

You probably also noticed that the SLOW key and the FAST key do not accomplish anything.

The reason for this is that the converted ZX-80 is always in the FAST mode. The ZX-81 also blanks the screen when it is in

the FAST mode.

However when the ZX-81 is in the SLOW mode, the screen graphics are retained. The ZX-80 does not have this capability.

The programs mentioned can be somewhat modified by finding the INKEY\$ commands and changing them to INPUT and by finding the FOR/NEXT loops and changing them to PAUSE loops. This helps somewhat in all the programs except BOUNCING-BOMBS. This is a shame because this game has excellent moving graphics which are either grossly distorted by the PAUSE loops or slowed down to the point where the game takes too long to play.

In this month's listed program, ARTIFICIAL INTELLIGENCE, add the following line, 445 INPUT A\$

We will try in the future to include instructions on how to convert ZX-81 programs to run on the converted ZX-80.

HOW TO MAKE PERFECT CASSETTE COPIES

As mentioned in last month's article, CASSETTE RECORDING INFORMATION, problems exist in trying to make good copies of programs from a computer. If you have tried all the hints mentioned in that article and still have problems, the reason usually lies in one of two areas.

If a program was recorded from a computer other than your own or from computer duplicating equipment and loads OK, but programs that were produced from your own computer do not load easily, it could be because:

1 - The internal circuitry of the computer that controls the saving of the programs is defective. This is not usually the case but can happen. Since the programs that were produced from an outside source load all right, the programs you try to save can be recorded with various degrees of improper data pulses. Before blaming the problem on the computer, first investigate the procedures that follow.

2 - The computer and/or cassette recorder are picking up excess noise from their Alternating Current power sources in the form of power spikes. These are caused by electrical machinery, fluorescent fixture transformers, arc welders, refrigerators, air compressors, air conditioners, etc.

If you have the type of recorder that can be run by batteries, remove the AC power cord and insert the proper batteries. Write a short program and then save it on cassette. Try to reload it and see if this helps. It should make no difference if the recorder is on

AC or DC when you are loading the program back into the computer. Some recorders may however have a problem keeping the drive motor operating at a constant RPM when they are powered by pure DC current from batteries, so make sure the batteries are fresh.

If this does not help, then the DC power input into the computer may be the culprit. There are different methods of achieving this. The problem may be the 9-VDC power supply itself but again this is not usually the case. The power supply can be filtered by an inexpensive FILTERED AC POWER SUPPLY such as the type sold by RADIO SHACK (part #15-1110 6.95).

The SINCLAIR 9-VDC power supply would be plugged into the filtered AC power supply. Now try saving a sample program and see what happens.

Using either or both of these methods will usually solve the problem. If it doesn't, there is one other method I have tried that worked just fine. I replaced the 9-VDC power source for the computer with a 9-VDC battery such as the EVEREADY #276, the RAY-O-VAC #1603 or the DURACELL #M1603. Of course the proper electrical connector had to be built. I used the ready built type sold by RADIO SHACK that has the miniature phono plug on one end of a cord and 2 wire leads with alligator clips on the other end.

CAUTION - OBSERVE PROPER POLARITY when using this method. The alligator clip that has continuity (connects) with the metal tip of the phono plug goes to the POSITIVE side of the battery. If you have any uncertainty or doubts as to this

hookup, ask someone who has some expertise in this area to do it for you. IMPROPER POLARITY MAY CAUSE DAMAGE TO THE COMPUTER

Fortunately, the CRT (TV) does not have to be turned off while you are saving a program

because it imparts no electrical input to the computer.

If you have experienced any problems with the computer, 16K RAM pack or with recording that you have or have not solved, please send us a letter and we will pass it on to the readers.

* **USER'S GROUPS** *

CHICAGO, IL
L.P. Weisel, 312-772-7461
After 6PM
C.A.C.H.E. INC.
280/Sinclair ZX S.I.G.
Box C-176
323 S. Franklin, #804
Chicago, IL, 60606

DENVER, CO
Cap Hamilton
767 S. Gaylord St.
Denver, CO, 80209
733-6857

FORT WAYNE, IND
Robert Carroll
Sinclair Midwest User's Group
PO BOX 13042
Fort Wayne, IN, 46866

HOUSTON, TX
Fayne Sisco
713-479-4571 after 6PM

IDAHO FALLS, ID
Wil Underwood
208-524-4635/PO BOX 1195
Idaho Falls, ID, 83401

LOS ANGELES, CA
George Kuby
PO BOX 34545
Los Angeles, CA, 90034
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Lane Lester
Lynchburg Microcomputer's
User's Group
804-237-5961
Div. of Natural Science

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User's Group
312 E. 84th St., #1A
New York, NY, 10028

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Box 560 Wall St.
New York, NY, 10005

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RD 1, BOX 539
Center Hall, PA, 16828
814-364-1325

PACIFICA, CA
George Mockridge
263 Gateway #107
Pacifica, CA, 94044

POMONA, CA
Rein Smith
Perkin Elmer User's Group
8333 Fulamo
Alta Loma, CA, 91701

PRINCE COUNTY, MD
Jim Wallace
5448 Tilden Rd.
Bladensburg, MD, 20710
301-699-8712

SAN FRANCISCO/SAN JOSE, CA
Paul Perrault
Stanford Telecommunications
Inc.
1195 Bordeaux Dr.
Sunnyvale, CA, 94086
408-734-5300

SEATTLE/TACOMA/EVERETT
Dan Gallery
1619 E. John St., #414
Seattle, WA, 98112
206-325-8186

TAMPA BAY, FL
Mel Routt/ SAM BAM User's Group
PO BOX 596
Safety Harbor, FL, 33572

To subscribe to SYNCHRO-SETTE, the User's magazine for the ZX-81 or 8K ROM ZX-80, please include the following information:

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Type of computer (1K or 16K, ZX-81 or ZX-80 8K ROM) -----
Additional equipment -----

You will receive a 12 month subscription that will include 12 issues of SYNCHRO-SETTE magazine and 6 cassettes that will include at least 3 - 1K programs and 3 - 16K programs.

Cassette issues will be sent on even-numbered months. If the subscription is processed on an odd-numbered month, it will automatically be predated one month as to include a cassette issue.

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